Navigating Vaccine Hesitancy

DR. VANESSA SLOTS
DEPARTMENT CHIEF GENERAL PEDIATRICS, RENOWN CHILDREN’S HOSPITAL
What is the problem?

- Vaccine coverage is not improving among children or adults
- Consistently miss public health goals
  - NV rates for most vaccine are below the national average
- Vaccine preventable diseases are increasing in the U.S.
  - Disneyland measles outbreak
  - Pertussis epidemic in California
  - Measles outbreak in Minnesota
- Popular messaging (internet, talk shows, blogs) question vaccine need and emphasize side effects
Hesitancy and Vaccines

- **Vaccine Hesitancy**
  - Intent to skip or delay at least 1 vaccine in accordance to the CDC schedule
  - Uncertainty as to whether a vaccine should be given

- Only 70% of children 19-35 months are up to date on routine immunizations

  - Gust et al (*Pediatrics 2008*) stated 28% of parents had doubts about vaccines

  - 2013 AAP Periodic Survey stated 87% of pediatricians reported encountering parents who delayed/refused vaccinations

  - 2006 survey showed 74.6%

- 0.7-3% of children in the US are completely unvaccinated and 13% of parents delay or select out of certain vaccines (Leask, *Pediatrics 2015; 136(1)*)

Vaccine Confidence

- Trust in the safety, efficacy and reliability of immunizations.

- Trust in the provider.
  - Nearly 97% who accepted vaccines reported trusting their pediatrician’s advice.
  - 69% who delayed vaccines and 38% of those who refused vaccines reported trusting their pediatrician’s advice.

## Parental Attitudes

<table>
<thead>
<tr>
<th>Parent Type</th>
<th>Belief about Vaccines</th>
<th>Percentage of Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunization Advocates</td>
<td>Strongly agree vaccines are safe and necessary</td>
<td>33%</td>
</tr>
<tr>
<td>Go Along to Get Alongs</td>
<td>Agree vaccines are safe and necessary</td>
<td>26%</td>
</tr>
<tr>
<td>Health Advocate</td>
<td>Agree vaccines are necessary but less sure about safety</td>
<td>25%</td>
</tr>
<tr>
<td>Fence-sitters</td>
<td>Slightly agree vaccines are necessary and safe</td>
<td>13%</td>
</tr>
<tr>
<td>Worrieds</td>
<td>Slightly disagree that vaccines are necessary and strongly disagree that vaccines are safe</td>
<td>3%</td>
</tr>
</tbody>
</table>

(Gust, et al. *American Journal of Health Behavior, 2005*)
Models to Address Hesitancy

- Time consuming process
  - 53% spend 10-19 minutes addressing concerns
  - 8% spent more than 20 minutes
  - Decreased job satisfaction reported


- 80% of parents stated that their decision to vaccinate was positively influenced by their provider

Strong Recommendation

- Presumptive vs Participatory Recommendations
  - Presumptive – more likely to see parents accept vaccines
    - “Today your child is due for MMR and Varicella”
    - “It’s time for the annual flu vaccine. Your child is old enough to receive either the inactivated shot or the live nasal spray”
  - Participatory
    - “Do you want to vaccinate your child today”

CASE Framework

- C – Corroborate
  - Acknowledge parent/patient concern
- A – About me
  - What have you done to enhance your knowledge
- Science
  - Describe what the science says
- Explain/Advise
  - Give your advice based on the science
A parent in your practice does not want his or her child to have the primary series of vaccines at the 2-month visit and is concerned about the number of vaccines the child will receive in the first year of life. The following is an example of an elevator pitch you might develop and reuse in your practice. Additional communication strategies for common parental concern scenarios are available in the CASE video presentation.26

- **Corroborate.** “You are correct. Your child will receive more vaccine than you or I did. We both want the same things for your child—to remain healthy and disease free. I know you are concerned, but it is my job to help address your concerns.”

- **About me.** “We follow the CDC schedule because it is designed to protect your child when he or she is most susceptible to these diseases. I have spent many years getting education and training in health and medicine, including vaccination. My expertise is why you are here. I have read the recommendations carefully and studied the risks and benefits.”

- **Science.** “Although your child gets more shots today, technology advances allow for development of vaccines using inactivated cells to generate an immune response. This immunological challenge is nothing compared with what your child fights off on a daily basis. An ear infection is a much more significant immune challenge than the vaccines I want to give to your child today.”

- **Explain/advise.** “I care about your son/daughter and do not want to practice substandard care. Your child needs to be fully vaccinated to protect against these diseases. I am fully vaccinated and my children are, too.”

Abbreviations: CASE, Corroborate, About me, Science, Explain/advise; CDC, Centers for Disease Control and Prevention. From Singer A, et al.26
Common Concerns

- Safety of vaccines/vaccine schedule
- Overloading the immune system
- Natural disease provides better immunity
- Neurological side effects including Autism
- Preservatives
Vaccine Safety - Development

- Vaccines must demonstrate both safety and efficacy before licensure.
  - Identification of a need for vaccine and understanding of immunity against that disease
  - Preclinical studies
  - Submission to FDA that describes the manufacturing and testing process, summarize the lab reports and describe proposed studies
  - Phase I, II and III trials
Vaccine Safety - Monitoring

- Long term safety must be monitored
  - Vaccine Adverse Events Reporting System (VAERS)
    - Voluntary, passive reporting
  - Vaccine Safety Datalink
    - Millions involved so can detect rare events
  - Post-Licensure Rapid Immunization Safety Monitoring System
    - Uses insurance claims of millions to monitor safety
  - Clinical Immunization Safety Assessment Project
Schedule Safety

- The current vaccine schedule is the ONLY recommended schedule.
- Safety of the CDC administration schedule was strongly affirmed by Institute of Medicine in 2013 and the Agency for Healthcare Research and Quality.
- No alternative vaccine schedules have been evaluated and found to provide better safety or efficacy.
An infant’s immune system has the capacity to respond to thousands of antigens at any given time.

- Exposed every day via toys, shopping carts, playground equipment.
- Immune system constantly replenished so can’t be overwhelmed.

While the amount of immunizations have increased, children receive fewer antigens than their parents.

The response to multiple vaccines is similar to the response that occurs when vaccines are given separately.

Offit et al. Pediatrics 2002;109(1)
<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Proteins</th>
<th>Vaccine</th>
<th>Proteins</th>
<th>Vaccine</th>
<th>Proteins</th>
<th>Vaccine</th>
<th>Proteins</th>
<th>Proteins/Polysaccharides</th>
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<tbody>
<tr>
<td>Smallpox</td>
<td>~200</td>
<td>Smallpox</td>
<td>~200</td>
<td>Diphtheria</td>
<td>1</td>
<td>Diphtheria</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>~200</td>
<td>Diphtheria</td>
<td>1</td>
<td>Tetanus</td>
<td>1</td>
<td>Tetanus</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Tetanus</td>
<td>1</td>
<td>WC-Pertussis</td>
<td>~3000</td>
<td>AC-Pertussis</td>
<td>2-5</td>
<td>Polio</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>WC-Pertussis</td>
<td>~3000</td>
<td>Polio</td>
<td>15</td>
<td>Measles</td>
<td>10</td>
<td>Measles</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Polio</td>
<td>15</td>
<td>Mumps</td>
<td>9</td>
<td>Rubella</td>
<td>5</td>
<td>Rubella</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>~3217</td>
<td>Mumps</td>
<td>9</td>
<td>Mumps</td>
<td>9</td>
<td>Mumps</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Rubella</td>
<td>5</td>
<td>Varicella</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>~3041</td>
<td>Varicella</td>
<td>69</td>
<td>Polio</td>
<td>15</td>
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<tr>
<td>Pneumococcus</td>
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<td>Varicella</td>
<td>69</td>
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</tr>
<tr>
<td>Total</td>
<td>~123-126</td>
<td>Varicella</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Natural Immunity

- The cost of natural immunity can be severe including death
- Low immunization rates leads to decreased herd immunity and puts the entire community at risk
  - Herd immunity contingent on a significant proportion of the population in a community being immune
    - 30-95% of individuals required to achieve herd immunity depending on the disease
Neurological Side Effects

- 1995 Seizures removed from Vaccine Injury Compensation Program for DTaP

- Golden demonstrated events were chance temporal associations

- Miller performed repeated studies that showed no link and that original study provided incomplete data

- Berkovic found multiple genetic causes of seizures

Offit, Paul. Deadly Choices
Institute of Medicine has shown that increased number of vaccines has NOT resulted in higher prevalence of neurodevelopment problems.

2010 the 1998 report alleging the link between MMR and Autism was retracted.

Several studies since have shown NO link between Autism and Vaccines.

Vaccines and autism show a TEMPORAL link not a CAUSAL link.

MMR is given around the same time autism is often diagnosed/become apparent despite being present earlier.
Correlation does not imply causation.

Preservatives
Thimerosal

- Thimerosal - mercury containing preservative that prevents bacterial and fungal contamination in vaccines
  - No link between Thimerosal and autism and was never in the MMR vaccine
  - Precautionary measures were taken given rising parental concerns and Thimerosal was removed from all individual dose vaccines in 2001
Preservatives
Aluminum Salts

- Aluminum salts - used to enhance the immune response from vaccines
  - Safety is well established
  - Abundant in our environment including in breast milk and all infant formula
Preservatives
Formaldehyde

- Formaldehyde - used to inactivate vaccines (Tetanus, diphtheria, influenza, polio)
  - Significantly diluted in the production process
  - Utilized in all humans to synthesize thymidine, purines and amino acids
To Dismiss or Not to Dismiss

- Dilemmas on both sides of the conversation
- Consistency, transparency and openness regarding vaccine policy is important
- “In general, pediatricians should avoid discharging patients from their practices solely because a parent refuses to immunize his or her child. However, when a substantial level of distrust develops, significant differences in the philosophy of care emerge, or poor quality of communication persists, the pediatrician may encourage the family to find another physician or practice.”

Diekema, Pediatrics, May 2005; 115(5)
Provider Resources

- CDC
  - www.cdc.gov/vaccines/hcp/conversations/index.html

- AAP have resources for vaccine conversations
  - Communicating with Families and Parental Refusal to Vaccinate

- Immunization Action Coalition
  - immunize.org
Parent Resources

- Children’s Hospital of Philadelphia Vaccine Education Center
  http://www.chop.edu/centers-programs/vaccine-education-center#.VrFWesdmbFI

- vaccinateyourbaby.org

- Books and articles by Dr. Paul Offit